

WHAT IS CLAIMED IS:

1. A method for efficiently solving an optimization problem having coupled variables distributed across a computer network architecture comprising at least two nodes each having local databases, the method comprising:

providing an optimization algorithm;

creating a plurality of coevolutionary agents implementing the optimization algorithm, each coevolutionary agent having a primary search variable and at least one secondary search variable, the plurality of coevolutionary agents distributed across the at least two nodes in the network architecture and the primary search variable of each coevolutionary agent corresponding to one of the at least one secondary search variables of the remaining coevolutionary agents;

conducting concurrent local searches using each coevolutionary agent at the corresponding one of the nodes where the coevolutionary agent is located, based on the primary search variable of the coevolutionary agent for producing local solutions using information available from the corresponding one of the local databases;

updating the primary search variable of each coevolutionary agent based on the corresponding one of the local solutions;

providing a plurality of mobile agents at the at least two nodes;

using the plurality of mobile agents to transport the local solutions produced at each node having a coevolutionary agent to all of the other nodes; and

updating the at least one secondary search

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variable of each coevolutionary agent using local solutions transported by the mobile agents using a coordination scheme.

2. A method according to claim 1, further comprising repeating conducting concurrent searches, updating the primary search variable, using the mobile agents to transport local solutions and updating the at least one secondary search variable to produce an optimized solution.

3. A method according to claim 2, further comprising accessing the optimized solution at any one of the at least one nodes.

4. A method according to claim 1, wherein the coordination scheme is selected from the group consisting of local, joint, pool, elite local, elite joint and elite pool schemes.

5. A method for solving a complex problem having multiple interdependent variables in a network-distributed environment comprising a plurality of nodes each having a corresponding local database, the method comprising:

providing an optimization algorithm relating the multiple interdependent variables;

creating a plurality of coevolutionary agents implementing the optimization algorithm, each coevolutionary agent setting one of the multiple interdependent variables as a primary search variable, the rest of the interdependent variables being defined as secondary search variables for

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the coevolutionary agent;

distributing the plurality of coevolutionary agents across the plurality of nodes;

conducting concurrent local searches using each coevolutionary agent at the corresponding one of the nodes where the coevolutionary agent is located, based on the primary search variable of the coevolutionary agent for producing local solutions from information available from the corresponding one of the local databases;

updating the primary search variable of each coevolutionary agent based on the corresponding one of the local solutions;

providing a plurality of mobile agents in the network-distributed environment;

using the plurality of mobile agents to transport the local solutions produced at each node having a coevolutionary agent to all of the other nodes; and

updating the at least one secondary search variable of each coevolutionary agent using local solutions transported by the mobile agents using a coordination scheme.

6. A method according to claim 5, further comprising repeating conducting concurrent local searches, updating the primary search variable, using the mobile agents to transport local solutions and updating the at least one secondary search variable to produce an optimized solution.

7. A method according to claim 6, further comprising accessing the optimized solution at any one of the at least

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one nodes.

8. A method according to claim 5, wherein the coordination scheme is selected from the group consisting of local, joint, pool, elite local, elite joint and elite pool schemes.

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